

## **REMARKS**

### **(A) STATUS OF THE APPLICATION**

#### **DISPOSITION OF CLAIMS**

- (i) Claims 11, 12, 16, and 19-21 are pending in the application.
- (ii) Claim 11 and 12 have been amended.
- (iii) Claims 1-10, 13-15, and 17-18 were previously canceled.
- (iv) Claims 11, 12, 16, and 19-21 have been rejected under 35 U.S.C. § 112, 2<sup>nd</sup> ¶.
- (v) Claims 11, 12, 16, and 19-21 have been rejected under 35 U.S.C. § 103(a).

### **(B) RESPONSE TO REJECTION OVER UNDER 35 U.S.C. § 112, 2ND ¶**

In the Final Rejection, Claims 11, 12, 16, and 19-21 were held to be indefinite under 35 U.S.C. § 112, 2<sup>nd</sup> paragraph, because in Claims 11 and 12 the term “(cyclo)aliphatic polyol,” is not supported in the originally filed Specification on Page 3. The specification is said not to disclose any examples of (cyclo)aliphatic polyols having 3 to 6 hydroxyl groups and that the specification only shows aliphatic polyols having 3 to 6 carbon atoms and not (cyclo)aliphatic polyols. The term “(cyclo)” has been deleted in the claims which obviates the rejection.

### **(C) RESPONSE TO REJECTION UNDER 35 U.S.C. § 103(A)**

The Examiner has maintained the rejection of the rejection of Claims 11, 12, 16, and 19-21 as obvious under 35 U.S.C. 103(a), over U.S. Patent No. 6,063,448 to Duecoffre, *et al.* “*hereinafter*” Duecoffre.

The Examiner has taken the following position “a coating of Duecoffre would have the same properties as in claimed invention, since it is made from a coating composition substantially identical to that of claimed invention” (see last paragraph, page 4 of the final office action). This position is totally incorrect.

Applicants have previously pointed out that Duecoffre’s hybrid polymers are different from a simple physical mixture of a (meth)acrylic copolymer and polyester polyol of Applicants’ invention. Duecoffre’s clear coat contains a hybrid binder comprising polyester polyol as one part, and the (meth)acrylic copolymer as the

second part. The polyester is not the polyester (a) of the composition used in Applicants' process.

Duecoffre formulates a hybrid polymeric system by forming a (meth)acrylic copolymer by free-radically polymerizing monomers in the presence of hydroxy-functional polyesters. (See Duecoffre, col. 1, lines 63-66, col. 2, lines 57-59, col. 12, Example 3 and claim 1.) Duecoffre clearly requires the (meth)acrylic copolymer to be produced in the presence of one or more of the hydroxyl functional polyesters. In contrast, the binder of the Applicants' invention is a simple physical mixture of the components. The degree of entanglement of the two different polymer chains is greater in the hybrid polymer system (Duecoffre) and the polymers may be covalently bonded in comparison to the simple physical mixture of two polymers Applicants invention.

The attached declaration submitted under 37 C.F.R. § 132 by Dr. Flosbach, clearly shows the surprising and unexpected results of Applicants' compositions when compared to the coating composition of Duecoffre that require the use of hybrid polymers.

The declaration shows that the following polymer compositions were prepared:

Polyester polyol (a) of Example 1 of the subject application, a non-aromatic polyester polyol within the scope of claims 11 and 12 of the polyester polyol (a) of these claims.

Polyester polyol (b) described in Example 1 of the subject application which is different from polyester polyol (a) above.

Comparison Polyester C described in Example 1 of Duecoffre having an acid value of 23, OH value (calculated) of 142, molecular mass (calculated) at acid value 23 of approximately 1800 and OH functionality of 4.5 which is outside of the scope of polyester polyol (a) of claim 11 and 12.

Comparison Polyester D described in Example 2 of Duecoffre having an acid value of 25, OH value (calculated) of 160, molecular mass (calculated) at acid value 25 of approximately 1000 and OH functionality of 2.8 which is outside of the scope of polyester polyol (a) of claim 11 and 12.

Comparison Acrylic/Polyester E (hybrid) described in Example 3 of Duecoffre.  
Comparison Acrylic/Polyester F (hybrid) described in Example 4 of Duecoffre.

Using the above polymer compositions six base compositions were formulated as shown in Table I of the declaration. Each of the compositions contained the same light stabilizer, UV absorber, leveling agent, and solvents in the same amounts as shown in Table I. Solvesso® 100 and 150 are solvents. Each base composition contained essentially the same amount of polymer. Base I only contained polyester polyol (b). Base II, **the invention**, contained a combination of polyester polyol (a) and polyester polyol (b). Comp. Base III contained polyester polyol (b) and Comparison Polyester C (Duecoffre, Ex. 1). Comp Base IV contained polyester (b) and Comparison Acrylic/Polyester D (Duecoffre, Ex. 2). Comp Base V contained only Comparison Acrylic/Polyester E (Duecoffre, Ex. 3). Comp Base VI contained only Comparison Acrylic/Polyester F (Duecoffre Ex. 4). "Comp" indicates a comparative composition.

Table II of the declaration shows the coating compositions that were prepared and tested. Cross-linker solutions I, II and III are described in the specification, page 9, lines 1-9 as Hardener solutions I-3. Cross-linker solution I contained hexamethylene diisocyanate isocyanurate in solvent. Cross-linker solution II contained hexamethylene diisocyanate isocyanurate and isophorone diisocyanate isocyanurate in solvent and Cross-linker solution III contained hexamethylene diisocyanate isocyanurate and isophorone diisocyanate isocyanurate in a different ratio than in Cross-linker solution II in solvent. Coating compositions 1, 2 and 3 each contained 100 parts by wt. Base I [polyester polyol (b) only] and 50 parts by wt. of Cross-linker solution I, II and III, respectively and are not within the scope of claims 11 and 12. Coating Compositions 4 – 6 represent **the invention** and each contained 100 parts by weight of Base II (invention) [polyester polyol (a) and polyester polyol (b)] and 50 parts by wt. of Cross-linker solution I, II and III, respectively. Coating composition 7 contained 100 parts by weight of Base III [polyester polyol (b) and Duecoffre Ex. 1] and 50 parts by weight of Cross-linker solution I. Coating composition 8 contained 100 parts by weight of Base IV [polyester polyol (b) and Duecoffre Ex. 2] and 50 parts by weight of Cross-linker solution I. Coating composition 9 contained 100 parts by weight of Base V (Duecoffre Ex. 3 acrylic/polyester hybrid) and 50 parts by weight of Cross-linker I. Coating composition 10 contained 100 parts by weight of Base VI (Duecoffre Ex. 4 acrylic/polyester hybrid) and 50 parts by weight of Cross-linker solution I.

Each of the coating compositions 1-10 prepared as shown in Table II of the declaration were spray applied to a metal substrate and dried and cured as taught in the specification, page 7, lines 24-31 and each of the coatings was tested as set forth in the specification, page 10, lines 4-22. The results of the tests are shown in Table II of the declaration.

The results of each of these tests are discussed below and clearly show the surprising and unexpected results achieved by the compositions of the invention in comparison to the compositions of Duecoffre.

Mar Resistance

The mar resistance of Coating Composition 4 (**invention**) was significantly better than Coating Composition 1 containing only polyester polyol(b). The results for Coating Compositions 5 and 6 (**invention**) in comparison to Coating Compositions 2 and 3 prepared only with polyester polyol (b) were substantially better.

The mar resistance of Coating Composition 4 (**invention**) was 80 in comparison to Coating Composition 7 (Duecoffre Ex 1) was 72 - an 11% improvement over Duecoffre.

The mar resistance of Coating Composition 4 (**invention**) was 80 in comparison to Coating Composition 8 (Duecoffre Ex 2) was 69 - an 16% improvement over Duecoffre.

The mar resistance of Coating Composition 4 (**invention**) was 80 in comparison to Coating Composition 9 (Duecoffre Ex 3) was 45 a 78% improvement over Duecoffre.

The mar resistance of Coating Composition 4 (**invention**) was 80 in comparison to Coating Composition 10 (Duecoffre Ex 1) was 51 a 57% improvement over Duecoffre.

### Tree resin exposure

The tree resin exposure rating of Coating Composition 4 (**invention**) was significantly better than Coating Composition 1 containing only polyester polyol (b). The results for Coating Compositions 5 and 6 (**invention**) in comparison to Coating Compositions 2 and 3 prepared only with polyester polyol (b) were also significantly better.

The tree resin exposure rating of Coating Composition 4 (**invention**) was 45 in comparison to Coating Composition 7 (Duecoffre Ex 1) was 35 - a 29% improvement over Duecoffre.

The tree resin exposure rating of Coating Composition 4 (**invention**) was 45 in comparison to Coating Composition 8 (Duecoffre Ex 2) was 35 - a 29% improvement over Duecoffre.

The tree resin exposure rating of Coating Composition 4 (**invention**) was 35 in comparison to Coating Composition 9 (Duecoffre Ex 3) was 43 - a 5% improvement over Duecoffre.

The tree resin exposure rating of Coating Composition 4 (**invention**) was 45 in comparison to Coating Composition 10 (Duecoffre Ex. 4) was 42 - a 7% improvement over Duecoffre.

### Pancreatin Exposure

The pancreatin exposure rating of Coating Composition 4 (**invention**) was significantly better than Coating Composition 1 containing only polyester polyol (b). The results for Coating Compositions 5 and 6 (**invention**) in comparison to Coating Compositions 2 and 3 prepared only with polyester polyol (b) also were significantly better.

The pancreatin exposure rating of Coating Composition 4 (**invention**) was 39 in comparison to Coating Composition 7 (Duecoffre Ex. 1) was 35 – an 11% improvement over Duecoffre.

The pancreatin exposure rating of Coating Composition 4 (**invention**) was 39 in comparison to Coating Composition 8 (Duecoffre Ex. 2) was 37– a 5% improvement over Duecoffre.

The pancreatin exposure rating of Coating Composition 4 (**invention**) was 39 in comparison to Coating Composition 9 (Duecoffre Ex. 3) was 39 – no improvement over Duecoffre.

The pancreatin exposure rating of Coating Composition 4 (**invention**) was 39 in comparison to Coating Composition 10 (Duecoffre Ex. 4) was 43 – a 9% improvement over the invention.

Sulfuric Acid (1%) Exposure

The sulfuric acid exposure rating of Coating Composition 4 (**invention**) was significantly better than Coating Composition 1 containing only polyester polyol (b). The results for Coating Compositions 5 and 6 (**invention**) in comparison to Coating Compositions 2 and 3 prepared only with polyester polyol (b) were similarly better.

The sulfuric acid exposure rating of Coating Composition 4 (**invention**) was 44 in comparison to Coating Composition 7 (Duecoffre Ex. 1) was 39 – a 13% improvement over Duecoffre.

The sulfuric acid exposure rating of Coating Composition 4 (**invention**) was 44 in comparison to Coating Composition 8 (Duecoffre Ex. 2) was 41– a 7% improvement over Duecoffre.

The sulfuric acid exposure rating of Coating Composition 4 (**invention**) was 44 in comparison to Coating Composition 9 (Duecoffre Ex. 3) was 47 – a 7% improvement over the invention.

The sulfuric acid exposure rating of Coating Composition 4 (**invention**) was 44 in comparison to Coating Composition 10 (Duecoffre Ex. 4) was 45 – a 2% improvement over the invention.

Sulfuric Acid Droplet Test

Coating Composition 4 (**invention**) had a value of 8 (the higher the number the greater the marking of the coating and no etching occurred in comparison to Coating Composition 1 containing only polyester polyol (b). The results for Coating Compositions 5 and 6 (**invention**) in comparison to Coating Compositions 2 and 3 prepared only with polyester polyol (b) were similarly better.

Coating Composition 4 (**invention**) had a value of 8 and no etching occurred in comparison to Coating Composition 7 (Duecoffre Ex. 1) which showed a value of 8 but etching at a value of 26. Coating Composition 8 (Duecoffre Ex. 2) showed a value of 10 and an etching value of 27. Coating Composition 9 (Duecoffre Ex. 3) showed a value of 10 with no etching and Coating Composition 10 (Duecoffre Ex. 4) showed a value of 13 with no etching. In all of the above comparisons, Coating Composition 4, (the **invention**) showed significantly better sulfuric values in regard to etching caused by sulfuric acid.

### FAM-Test

FAM Test shows the resistance of a coating to solvents. Values range from 0 which shows no softening or swelling of the coating to 5 which shows complete softening of the coating.

Coating Composition 4 (**invention**) had a value of 0-1 which was significantly better than Coating Composition 1 containing only polyester polyol (b). The results for Coating Compositions 5 and 6 (**invention**) in comparison to Coating Compositions 2 and 3 prepared only with polyester polyol (b) were significantly better.

Coating Composition 4 (**invention**) had a value of 0-1 indicating no softening or swelling in comparison to Coating Composition 7 (Duecoffre Ex. 1) which had a value of 4-5 showing complete softening of the coating. Coating Composition 8 (Duecoffre Ex. 2) had a value of 5 also showing complete softening of the coating. Coating Composition 9 (Duecoffre Ex. 3) and Coating Composition 10 (Duecoffre Ex. 4) each had a value of 2 showing only slight softening of the coating.

The declarant, Dr. Flosbach, concluded that according to the above tests, Coating compositions 4-6 (**invention**) had significantly better properties than Coating Composition 1-3 formed with a single polyester. In regard to Duecoffre, Dr. Flosbach concluded that Coating Composition 4 (**invention**) according to the tests conducted herein showed surprisingly superior physical properties to all of the Coating Compositions 7-10 of Duecoffre. Based on these results, the hybrid polyester acrylic polyol polymers prepared according to the teachings and Examples of Duecoffre do not form the same polymer compositions as those physical mixtures of polyester polyol and acrylic polymer compositions used to form the coating compositions of the invention as has been alleged by the Examiner and Dr. Flosbach concluded that the Examiner's position is incorrect.

The attached declaration provides the supporting evidence that the coating compositions formed from Duecoffre's hybrid polymer composition are not the same as those of Applicants' invention and Applicants' compositions provide surprisingly unexpected superior properties in comparison to compositions formed with the hybrid polymers taught by Duecoffre. In light of the surprising and unexpected results of Applicants compositions as set forth in the attached declaration, the claims are unobvious and patentable over Duecoffre. Further, Duecoffre does not disclose all elements of Claims 11 and 12 and a *prima facie* case for obviousness has not been made. In light of the above, Applicants submit that the 35 U.S.C. § 103(a)

based rejection of obviousness of pending Claims 11, 12, 16, and 19-21 should be withdrawn and the claims allowed.

### CONCLUSION

In view of the above remarks, Applicants respectfully submit that they properly traversed, accommodated, or rendered moot, the stated grounds of rejection and that they have made a complete response to the Final Office Action dated February 12, 2008 and to the Advisory Action of June 2, 2008.


Therefore, Applicants believe that the application stands in condition for allowance with withdrawal of all grounds of rejection and respectfully solicit a Notice of Allowance.

If the Examiner has questions regarding the application or the contents of this response, Applicant invites the Examiner to contact the undersigned.

Please charge any unaccounted fee that may be due, to Deposit Account No. 04-1928 (E. I. du Pont de Nemours & Co.).

RESPECTFULLY SUBMITTED,

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